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Perioperative outcomes of Senhance robotic surgery versus conventional laparoscopy in appendectomy and cholecystectomy

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Abstract

Background

The clinical performance of Senhance robotic surgery in routine appendectomy and cholecystectomy has not been fully established.

Methods

Appendectomy and cholecystectomy cases performed between October 2022 and October 2025 were retrospectively examined, with outcomes compared according to surgical approach.

Results

For appendectomy (30 vs. 30), the Senhance group showed shorter operative duration and reduced hospitalization. In cholecystectomy (107 vs. 107), operative duration and hospital stay were likewise shorter with Senhance. Complication and conversion rates were comparable.

Conclusions

Within this single-center experience, Senhance robotic surgery demonstrated favorable perioperative outcomes without increased morbidity.

Introduction

The use of robotic platforms in minimally invasive general surgery has increased in recent years, including procedures such as appendectomy and cholecystectomy. However, evidence regarding the perioperative impact of different robotic platforms in these procedures remains limited.

The Senhance robotic system (Asensus Surgical, Durham, NC, USA) incorporates articulation and haptic feedback while maintaining laparoscopic-based operative concepts[1–3]. Whether these technical characteristics translate into measurable clinical advantages in daily practice is still uncertain.

This study compared perioperative outcomes between Senhance robotic surgery and conventional laparoscopy for appendectomy and cholecystectomy at a single institution.

Methods

We reviewed all appendectomy and cholecystectomy procedures performed between October 2022 and October 2025. Surgical approach (Senhance or laparoscopy) defined group allocation.

Collected parameters included age, sex, BMI, operative duration, estimated blood loss, length of stay, and complications graded ≥ II according to Clavien–Dindo. Open conversion was recorded.

Group differences were evaluated using the Mann–Whitney U test or Fisher's exact test. A p value < 0.05 was considered significant.

Ethical approval

This retrospective study was approved by the Ethics Committee of Saiseikai Shiga Hospital (Approval No. 835) and conducted in accordance with the Declaration of Helsinki.

Results

Patient Characteristics

Age, sex, and BMI distributions were similar across the Senhance and laparoscopic groups in both appendectomy (Table 1a) and cholecystectomy (Table 1b).

Appendectomy

Operative duration was shorter in the Senhance group. Hospitalization time was also reduced. Complication rates were comparable. No open conversion occurred.

Cholecystectomy

The Senhance cohort showed reduced operative duration. Hospital stay was shorter. Although male distribution differed, complication rates remained comparable. No conversion to open surgery was observed.

Discussion

Operative duration and hospitalization were shorter in patients treated with Senhance for both procedures, whereas blood loss, complications, and conversion rates remained similar.

These findings suggest that Senhance can be implemented without compromising perioperative safety in a laparoscopic-experienced center.

Limitations include the retrospective design and single-institution setting. Broader evaluation will require prospective multicenter studies.

Conclusion

Senhance robotic surgery appears to represent a feasible option for appendectomy and cholecystectomy. Operative time and postoperative hospital stay were shorter with Senhance, without increases in morbidity or conversion rates.

Declarations

Funding: The authors received no specific funding for this study.

Conflict of Interest: The authors declare no conflicts of interest.

Informed Consent: The requirement for informed consent was waived due to the retrospective nature of the study.

Author Contributions JF designed the study and drafted the manuscript. HK, II, and SK collected the data. TI, TK, and MM supervised the study. All authors reviewed and approved the final manuscript.

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Tables

Table 1 is available in the Supplementary Files section.

Supplementary Files

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